

REMARKS

Claims 1-3, 5-11, 13-19, 21-27, and 29-32 are now pending in the application. Dependent claims 4, 12, 20, and 28 are cancelled as their features have been incorporated into independent claims 1, 9, 17, and 25, respectively. Claims 3, 11, 19, and 27 have been rewritten in independent form. Claims 18, 19, and 22 are amended to correct typographical errors. Minor amendment also has been made to claim 24 to overcome an objection under 35 U.S.C. § 112; the amended claim is of equivalent scope as originally filed.

ALLOWABLE SUBJECT MATTER

The Examiner states that claims 4, 5, 12, 13, 20, and 21 would be allowable if rewritten in independent form. Applicants thank the Examiner for the careful consideration of these claims. Accordingly, the features of dependent claims 4, 12, and 20 are incorporated into independent claims 1, 9, and 17, respectively, and claims 4, 12, and 20 are cancelled. Claims 2, 5-8, 10, 13-16, 18, and 21-24 are dependent on the amended independent claims 1, 9, and 17 and should now be allowable based on the amended independent claims.

The remaining claims (i.e., claims 3, 11, 19, 25-27, and 29-32) stand rejected. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 112

Claim 24 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention.

Claim 24 has been amended to replace “multi-stage compressor system” with “method” so that the claim is no longer indefinite. Applicant respectfully requests reconsideration and withdrawal of the rejection.

REJECTION UNDER 35 U.S.C. § 102

Claims 1-3, 6, 9-11, 14, 17-19, 22 and 25-30 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Buswell et al. (U.S. Pat. No. 5,360,679). This rejection is respectfully traversed.

The rejection of claims 1, 2, 6, 9, 10, 14, 17, 18, and 22 has been rendered moot, since these claims are either amended to incorporate allowable subject matter or are now dependent on claims that have incorporated allowable subject matter.

Amended claims 3, 11, 19, and 27 have been rewritten in independent form to incorporate the features of claims 1 and 2, 9 and 10, 17 and 18, and 25 and 26, respectively. As such, the Buswell reference does not contain all the features of the present invention as embodied within amended independent claims 3, 11, 19, and 27, and therefore cannot anticipate these claims. “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Claims 3, 11, 19, and 27 include multi-stage compressor systems, fuel cell systems, methods of operating fuel cells systems, and methods of compressing air supplied to a cathode of a fuel cell system. These various systems and methods comprise, among other features, a first heat exchanger and a second heat exchanger. The second heat exchanger is disposed between the first stage compressor and the second stage compressor to reduce a temperature of the first pressurized air stream. Furthermore, the second heat exchanger is in series with the first heat exchanger and enables heat transfer between the first pressurized air stream and the exhaust stream. Claims 3, 11, 19, and 27; and see FIG. 3 for an exemplary embodiment constructed in accordance with the claims and present disclosure. At a minimum, the Buswell reference fails to teach methods and systems comprising the second heat exchanger as embodied in these independent claims.

The Buswell reference discloses an integrated fuel cell electric power generation system. The system comprises an air pressurization subsystem that includes a two-stage turbocompressor to produce a pressurized air stream. A compressor intercooler 132 can cool the pressurized air stream 16 exiting the first stage 120 where it is then delivered to the second stage 134 of the two-stage turbocompressor. Buswell FIG. 1; col. 6, line 50 et seq. The compressor intercooler 132, located between the first stage 130 to the second stage 134, does not transfer heat between the pressurized air stream 16 to an exhaust stream (i.e., the anode exhaust stream 24 or the cathode exhaust stream 25). Buswell does not teach a second heat exchanger disposed between the first stage compressor and the second stage compressor to reduce a temperature of the first pressurized air stream, wherein the second heat exchanger is in series with the first

heat exchanger and enables heat transfer between the first pressurized air stream and the exhaust stream.

Amended independent claim 25, incorporating the features of cancelled claim 28, and its dependent claims 29 and 30, are not anticipated by Buswell. Claim 25 includes the step of “circumventing said second stage compressor when said fuel cell system is operating in a first mode and directing said first pressurized air stream to said second stage compressor when said fuel cell system is operating in a second mode”, which is not found in Buswell. The Buswell system is continuous from the first stage 130 compressor to the second stage 134 compressor; there is no means by which the second stage 134 compressor can be circumvented when operating in a first mode. Buswell, col. 6, line 53 to col. 7, line 2; FIG. 1. Accordingly, claim 25 and dependent claims 29 and 30 are not anticipated.

Since Buswell is missing at least the aforementioned features of the present claims, the reference is not anticipatory. Applicant respectfully requests reconsideration of the claims and withdrawal of the rejection.

REJECTION UNDER 35 U.S.C. § 102 AND/OR § 103

Claims 7, 8, 15, 16, 23, 24, 31 and 32 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Buswell et al.

The rejection of claims 7, 8, 15, 16, 23, and 24 has been rendered moot, since these claims have been amended to incorporate allowable subject matter or are now dependent on claims that have incorporated allowable subject matter.

Dependent claims 31 and 32 are not anticipated by the Buswell reference. Claims 31 and 32 depend on amended independent claim 25, which as discussed in the preceding section contains features not found in Buswell. In particular, these claims include the claim 25 step of “circumventing said second stage compressor when said fuel cell system is operating in a first mode and directing said first pressurized air stream to said second stage compressor when said fuel cell system is operating in a second mode.” In contrast, the Buswell system is continuous from the first stage 130 compressor to the second stage 134 compressor; there is no means by which the second stage 134 compressor can be circumvented when operating in a first mode. Buswell, col. 6, line 53 to col. 7, line 2; FIG. 1.

In addition to the absence of a circumventing step, the Buswell reference does not render the present claims obvious as there is no suggestion, appreciation, or motivation found in Buswell by which a skilled artisan would include a means for circumventing the second stage compressor. If anything, Buswell teaches away from circumventing the second stage compressor, as Buswell expressly runs the second stage compressor 134 with the exhaust stream 32 in order to power the turbine portion of the second stage compressor 134. Furthermore, an auxiliary burner 136 can be used to heat the exhaust stream 32 to run the compressor turbine. Buswell et al. col. 10, line 55 et seq. Thus, a skilled artisan would not be motivated by the teachings of Buswell et al. to circumvent the second stage compressor.

In sum, since the Buswell et al. reference fails to include all the features of the present independent claims and provides no motivation to a skilled artisan to alter or modify the Buswell teachings to include such features. Accordingly, the present claims

are not anticipated or obvious in view of Buswell et al. Applicants respectfully request reconsideration and withdrawal of the rejection.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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